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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,560	02/11/2004	Harry S. Luan	108-18.1	5757

7590 07/26/2005

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EXAMINER

NGUYEN, THINH T

ART UNIT PAPER NUMBER

2818

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/777,560

Applicant(s)

LUAN ET AL.

Examiner

Thinh T. Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED OFFICE ACTION

1. Applicant's election of claims 1-14 for prosecution of the application without traverse in the communication with the Office on 7/14/2005 is acknowledged.

Specification

2. The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant cooperation is requested in correcting any errors of which the applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102(a/b/e) that form the basis for the rejections under this section made in this office action.

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

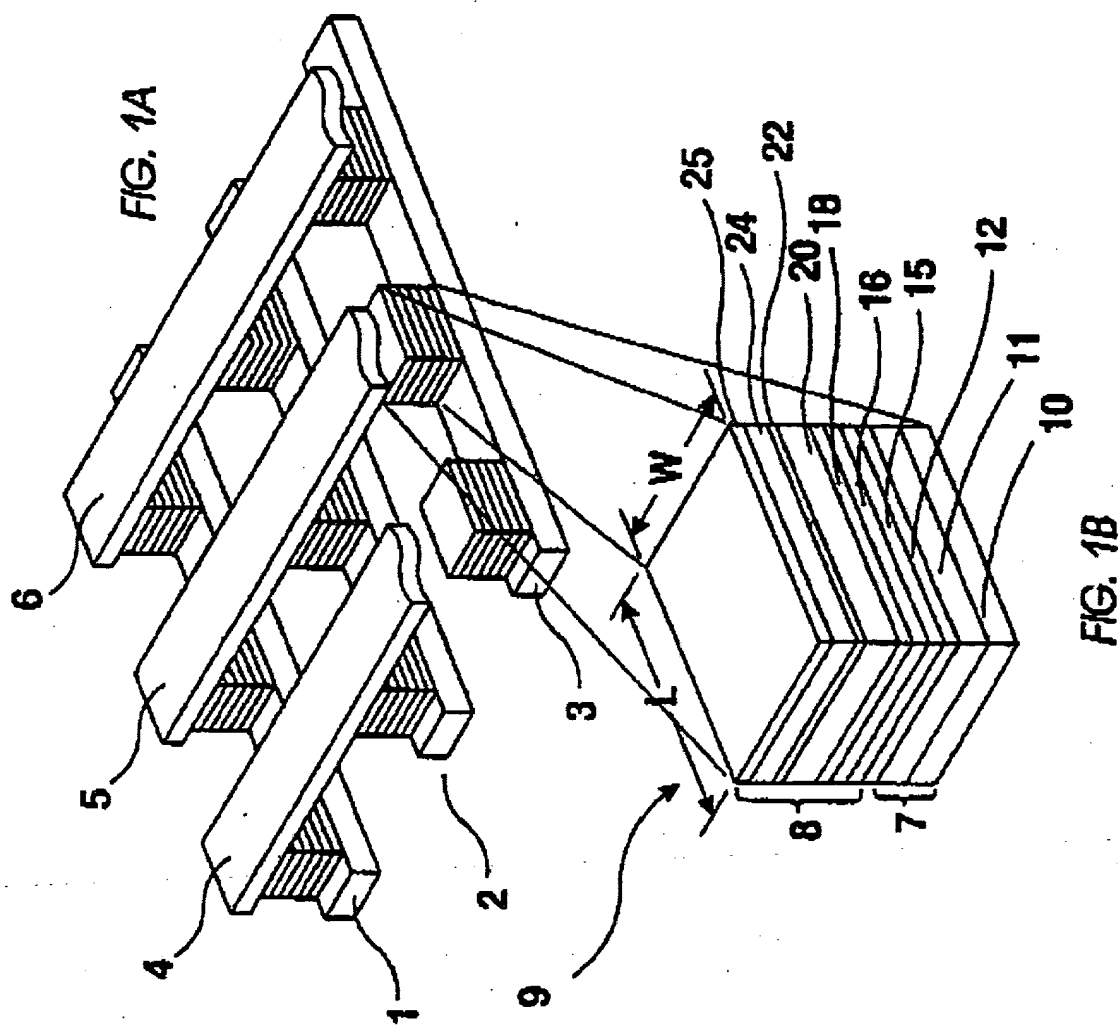
4. Claim 1,6, are rejected under 35 U.S.C. 102(b) as being anticipated by Gallagher et al. (U.S. Patent 5,640,343) .

REGARDING CLAIM 1

Gallagher discloses (fig 1A, Fig 2) an integrated circuit comprising: a first array of memory cells, each memory cell in the first array comprising a resistive element (column 2 lines 33-34) and a Schottky diode (column 10 line 61-64) coupled in series and having first and second terminals; a first plurality of bit lines, one bit line for each column of the first array, each bit line coupled to the first terminal of memory cells in a respective column of the first array; and a first plurality of word lines, one word line for each row of the first array, each word line coupled to the second terminal of memory cells in a respective row of the first array.

REGARDING CLAIM 6

Gallagher discloses (fig 1A, Fig 2) a memory arrays with cells that are formed at cross-point between a bit line and a word line.



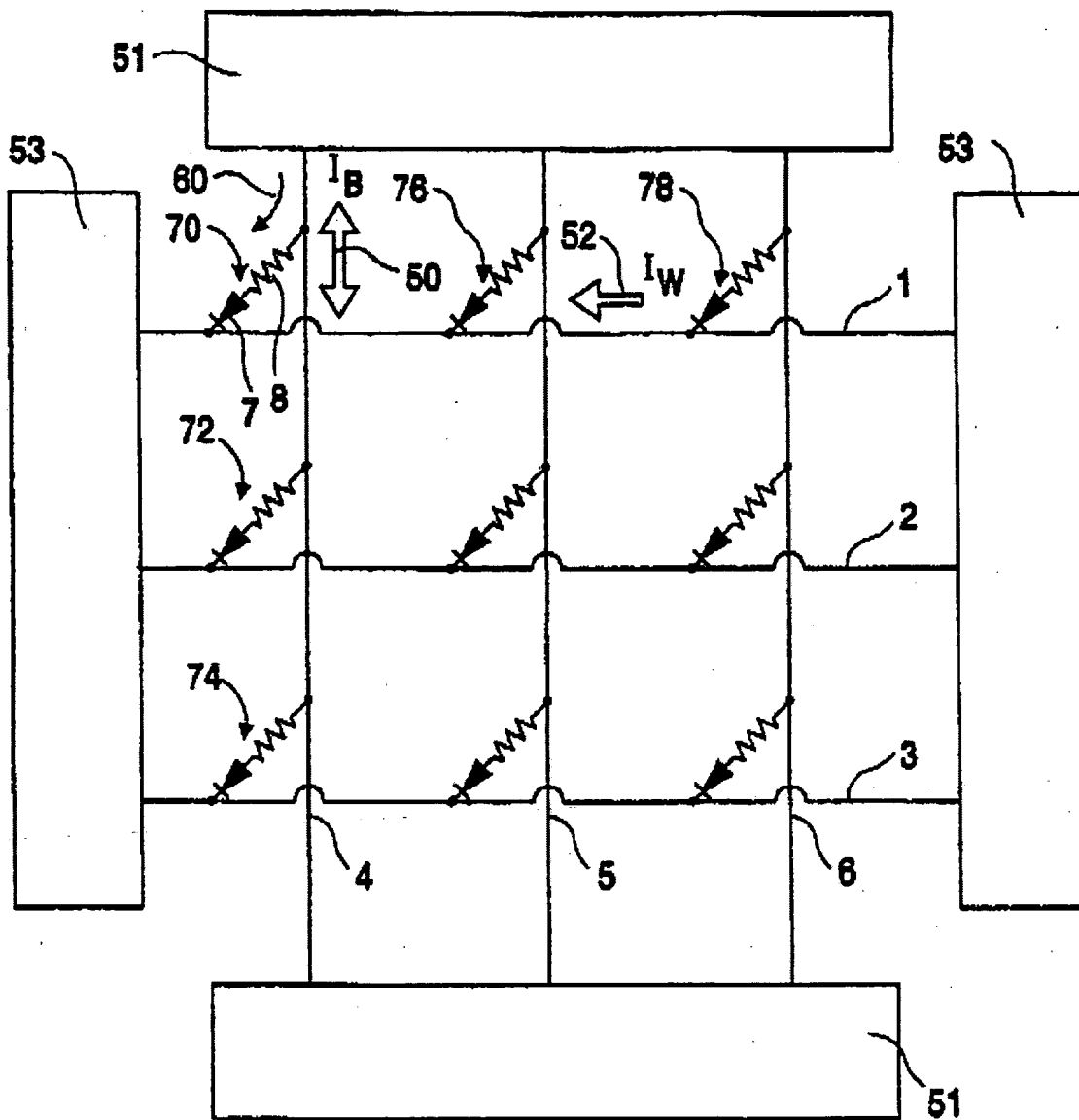


FIG. 2

Claim Rejections - 35 USC § 103

5. The following is a quotation of U.S.C. 103(a) which form the basis for all obviousness rejections set forth in this office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher et al. (U.S. Patent 5,640,343) In view of further remark.

REGARDING CLAIM 5

Gallager discloses (fig 1A, Fig 2) all the invention including a schottky switching element except for the specific detail that the schottky diode are made of amorphous silicon. This feature , however, is considered obvious since the use of schottky diode made of amorphous silicon is old and well known in the art as evidenced by the disclosure by Shanks (US patent 4,203,123) in fig 3B and in column 4 lines 5-11.

7. Claims 2,3 ,4,7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rinerson (U.S. patent 6,870,755) in view of Kim (US patent 6,750,540).

REGARDING CLAIM 2,3

Rinerson (the abstract, fig 2, fig 5, column 5 line 27-45) discloses all the invention including a perovskite PCMO ($\text{Pr}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$) resistive material.

Missing in the teachings by Rinerson is the use of Schottky diode as switching element..

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Kim, however, (the abstract, claim 3) teaches the use of Schottky diode as switching element in combination with the resistive material in a memory array.

It would have been obvious to one of ordinary skill in the art the time the invention was made to complement the teachings by Rinerson with the teachings by Kim and come up with the invention of claim 2 or 3.

The rationale is as the following:

A person skilled in the art at the time the invention was made would have been motivated to improve the structure of the device invented by Rinerson by simplifying it using the teachings by Kim to improve its integration as suggested by Kim in the abstract. Moreover, Schottky diode is well known in the art for providing faster switching time, therefore, a person skilled in the art would have been motivated to improved the switching time of the Rinerson device by replacing the regular diode with the schottky diode.

REGARDING CLAIM 4

Rinerson (column 4 lines 25-32,column 5 lines 27-45) discloses the use of Perovskite Colossal resistive material.

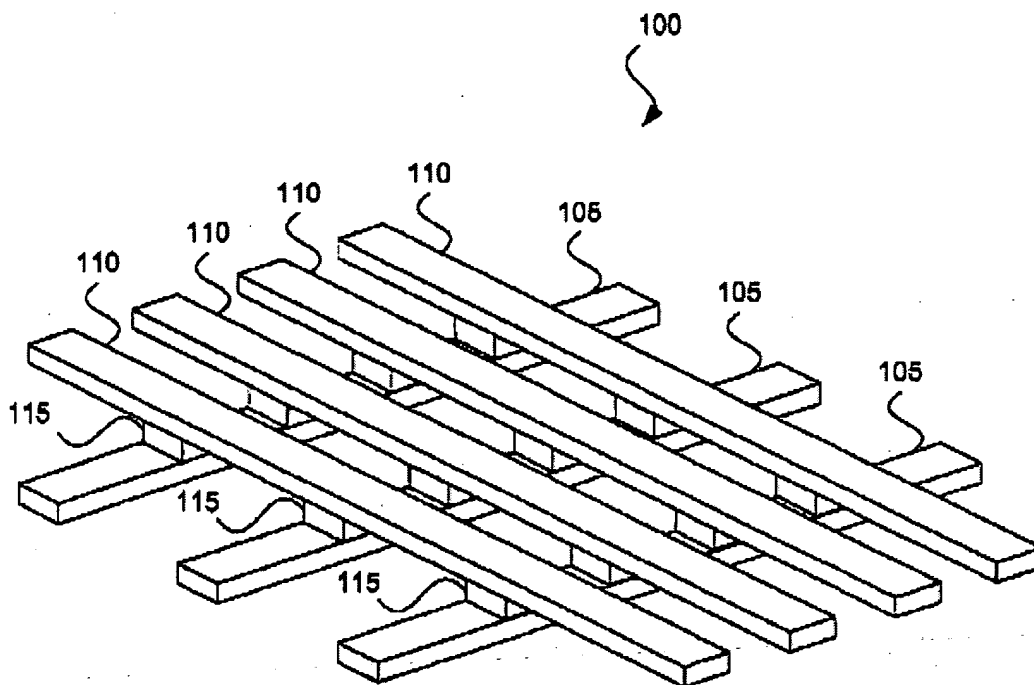
The rationale as why it is logic to combine the teachings of Rinerson with the teachings by Kim in order to come up with the invention of claim 4 has been discussed in the rejection of claim 2,3

REGARDING CLAIM 7

Rinerson (column 5 lines 28-29, column 6 lines 24-25,column 10 lines 1-2) discloses a Memory that can be program and that has two states.

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The rationale as why it is logic to combine the teachings of Rinerson with the teachings by Kim in order to come up with the invention of claim 7 has been discussed in the rejection of claim 2,3

**FIG. 1**

8. Claims 8,9 ,10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rinerson (U.S. patent 6,870,755) in view of Kim (US patent 6,750,540) and in further view by Marquot et al. (US patent 5,978,262)

REGARDING CLAIM 8

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As discussed in the rejection of claim 2,3 the combined teachings by Rinerson and Kim disclose all the invention except for the use of bit line driver that can read and program the memory cell. Marquot; however, teaches (in the abstract) the use of bit line driver that can read and program the Matrix non-volatile magnetic memory cell.

It would have been obvious to one of ordinary skill in the art the time the invention was made to complement the teachings by Rinerson with the teachings by Kim and the teachings by Marquot and come up with the invention of claim 8.

The rationale is as the following: as person skilled in the art at the time the invention was made would have been motivated to reduce the overall programming time as suggested by Marquot (see Marquot reference column 2 lines 9-10).

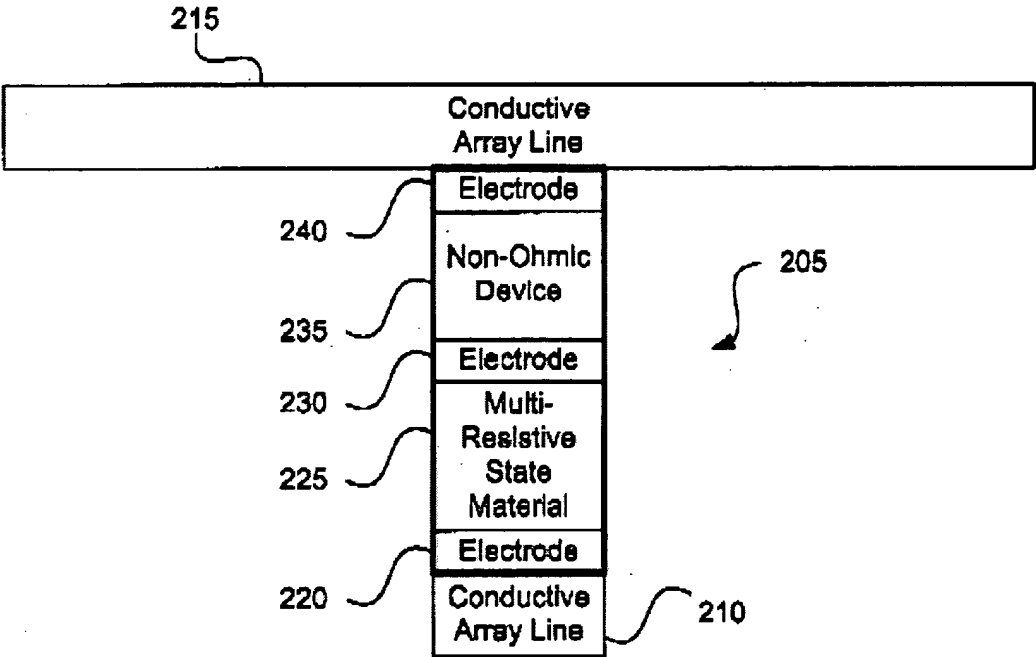


FIG. 2

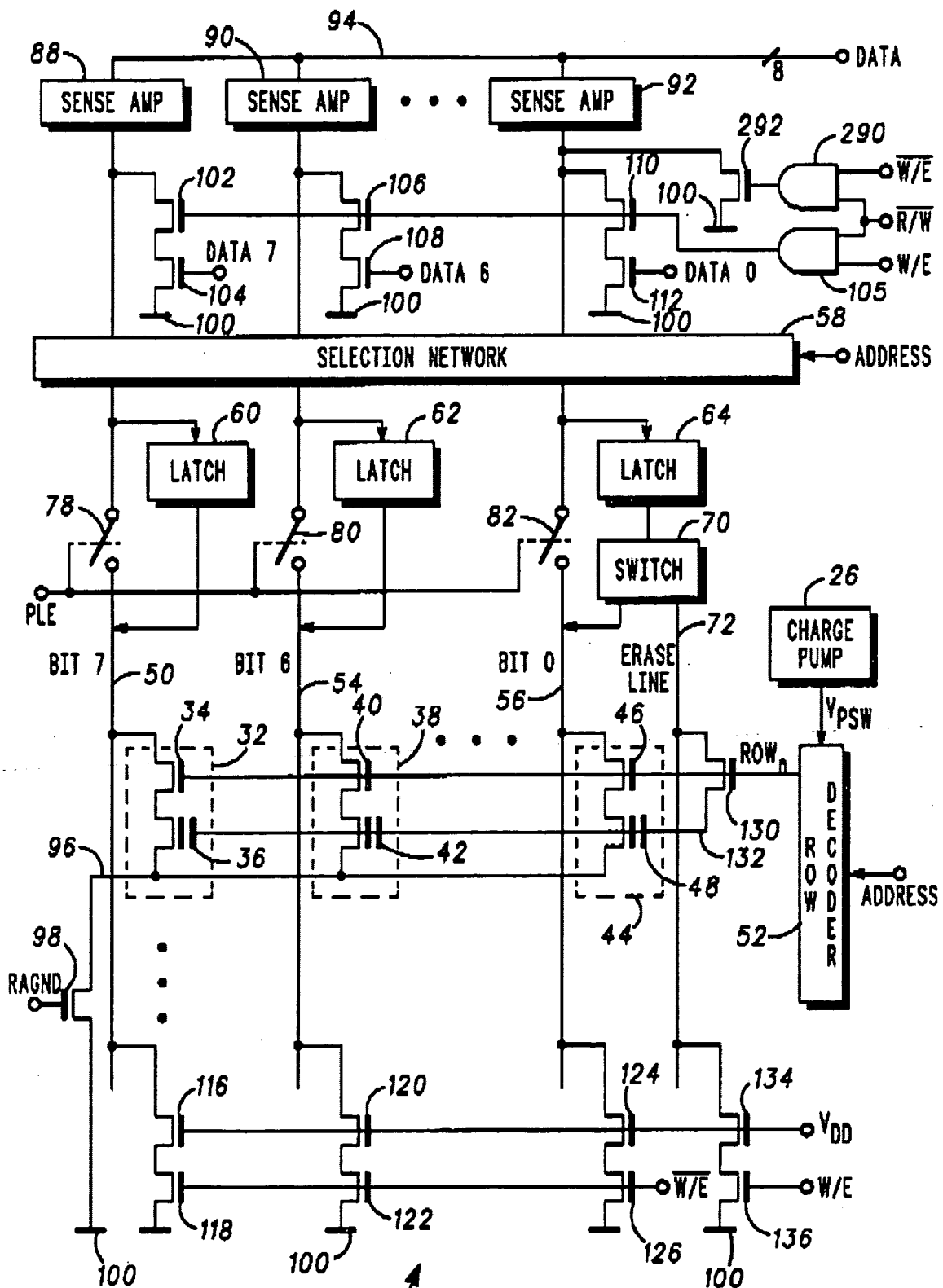


FIG. 3

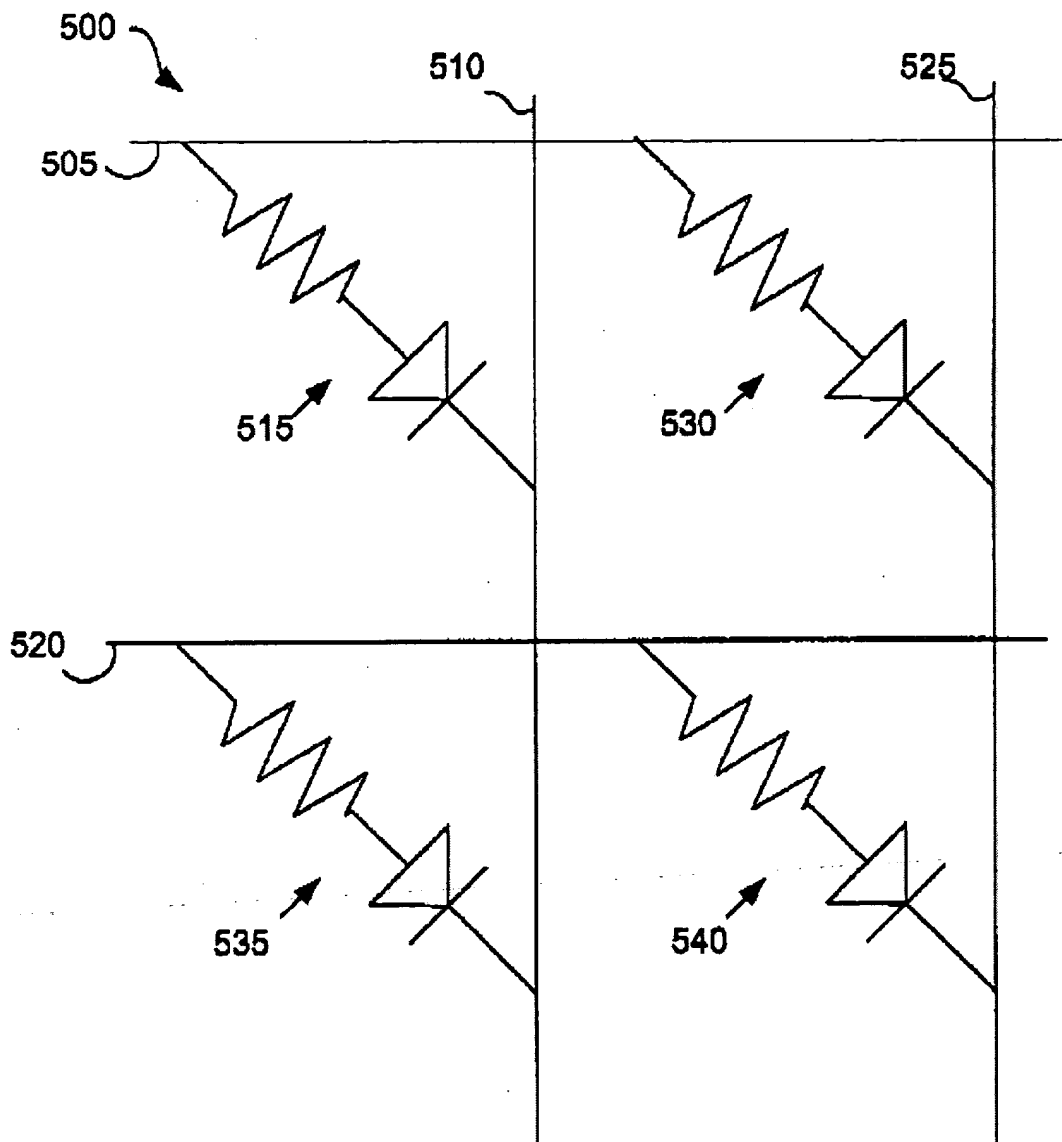


FIG. 5

REGARDING CLAIM 9

Marquot discloses (in fig 3,column 3 lines 42-50) a word line decoder (Marquot called it the row decoder) for reading and programming the memory cell. Noted that on top of the row

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decoder in fig 2 there is a charge pump 26 that can be used among other thing to program the memory cells.

The rationales why claim 9 is obvious over prior arts have been discussed in the rejection of claim 8.

REGARDING CLAIM 10

Marquot discloses (in fig 3) disclose a plurality of sense amplifiers (reference 88,90,92) Those are coupled to the bit lines to read the state of the memory cells.

The rationales why claim 10 is obvious over prior arts have been discussed in the rejection of claim 8.

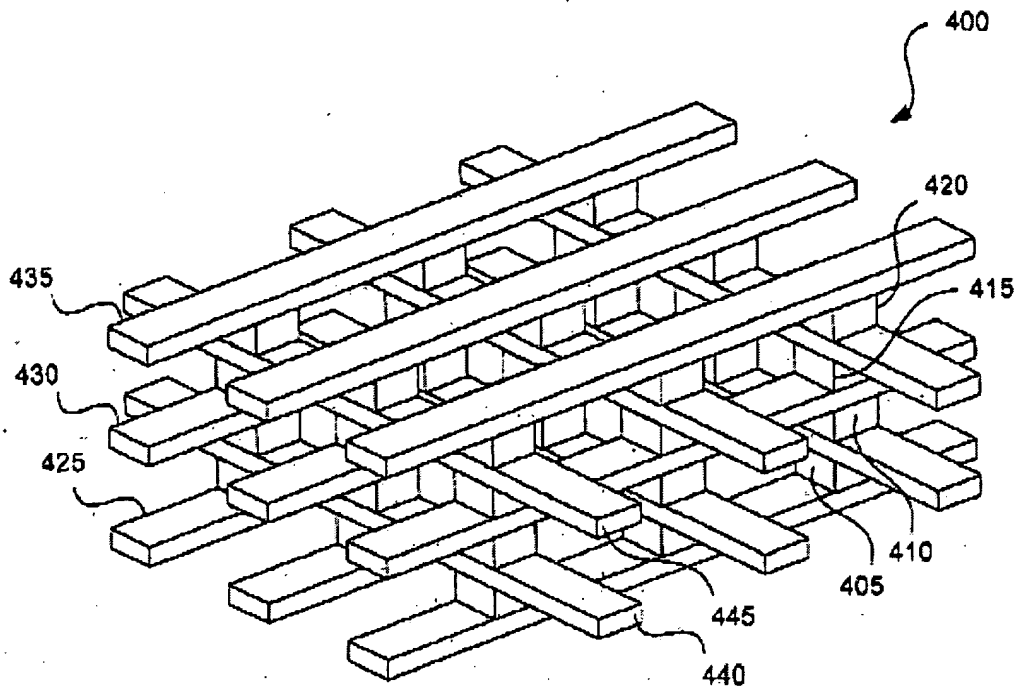
9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rinerson (U.S. patent 6,906,939) in view of Kim (US patent 6,750,540).

REGARDING CLAIM 11

Rinerson 939 (fig 2,fig 4A) disclose all the invention including a second array of memory cells, each memory cell in the second array comprising a resistive element and a diode coupled in series and having first and second terminals; a second plurality of bit lines, one bit line for each column of the second array, each bit line coupled to the first terminal of memory cells in a respective column of the second array; and a second plurality of word lines, one word line for each row of the second array, each word line coupled to the second terminal of memory cells in a respective row of the second array except for the use of schottky diodes.

Kim, however, (the abstract, claim 3) teaches the use of Schottky diode as switching element in combination with the resistive material in a memory array.

The rationale why claim 11 is obvious over prior arts has been discussed in the rejection of claims 2,3.



10. Claim 12,13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rinerson (U.S. patent 6,906,939) in view of Kim (US patent 6,750,540) and in further view of Marquot et al. (US patent 5,978,262)

REGARDING CLAIM 12

The combined teachings by Rinerson 939 and Kim disclosed all the invention except going into detail about the use of decoder and sense amplifiers. These features, however, are considered obvious since they are old and well known in the memory art as evidenced by the disclosure by Marquot (fig 3).

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The rationales why claim 12 is obvious over prior arts have been discussed in the rejection of claim 8.

REGARDING CLAIM 13

Rinerson discloses (in column 6 lines 39-40) the use of a perovsksite film.

The rationales why claim 13 is obvious over prior arts have been discussed in the rejection of claim 8.

11. Claim 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Rinerson (U.S. patent 6,906,939) in view of Kim (US patent 6,750,540) and Marquot et al. (US patent 5,978,262) and in further view remark.

REGARDING CLAIM 14

As previously discussed in the rejection of claim 12 the combined teachings by Rinerson 939, Kim and Marquot disclose all the invention of claim 14 except for the specific use of amorphous silicon schottky diodes switching element. However, the use of amorphous silicon schottky diodes as switching elements is old and well known in the art as discussed in the rejection of claim 5.

A person skilled in the art at the time the invention was made would be able to use the teachings by Rinerson 939 and Kim and his ordinary design skill and come up with claim 14 without any special teachings.

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12. When responding to the office action, Applicants are advised to provide the examiner with the line numbers and the page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

13. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to be abandoned (see M.P.E.P. 710.02(b)).

CONCLUSION

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thinh T Nguyen whose telephone number is 571-272-1790.

The examiner can normally be reached on Monday-Friday 9:00am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached at 571-272-1787.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval [PAIR] system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thinh T. Nguyen

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A handwritten signature in black ink, appearing to read 'Thinh T. Nguyen', is written over a horizontal line.